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Winning For The Public

A Strategy for Licensing and Relicensing Dams

U.S. Department of the Interior • Bureau of Land Management
May 1998

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Preface

The objective of this report is to provide information and perspective so that the reader gains awareness, understanding, and acceptance of the requirements for licensing new dams and relicensing existing public dams. This understanding requires a brief explanation of the intent of Congress when they provided the legislative framework for the process. It also requires an explanation of subsequent Congressional requirements that alter the process and provide opportunities for clarifying decisions. Finally, the understanding of the process of licensing and relicensing dams is contingent on the roles of several government agencies, including State governments and agencies in the Departments of Agriculture, Energy, and the Interior. This report is not intended to be comprehensive, but is intended to be an educational tool that provides a basic understanding of the process.

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"During my entire career, I have been told that the river had to be this way and that I could not do anything about it! I have proposed, argued, and pleaded that there is unnecessary damage happening in the river. There are needs for more water to be released from the dam at specific times. The dam could be used for beneficial purposes instead of as a moneymaker for the owner. It would be so easy to change. But NO...this is the way it has to be.

Now, you are trying to tell me that you want me to state how the dam could be used for my interests? That now I have the opportunity to change how the river flows by changing the operation of the dam? That the rules have changed, and I should use my skills, knowledge, and abilities to argue for public benefits?...I don't know if I trust you. I want to know what the opportunities are and why it is worth my time to prepare facts and determine the benefits of change."

The Licensing Game

Every day in America, a rather large contingency of people are grappling with the future of fresh water and "their river." The opportunity to debate changes in "their river" is a personal challenge that will only occur once in a lifetime, and the magnitude of the opportunity needs to be explained. Opportunities for building dams to solve fresh water problems are being debated in several parts of the country. Simultaneously, the future of existing dams is also being debated. After allowing existing dams to operate one way for 50 years, it is intimidating to think that their operation for the next 50 years is up for grabs. However, the opportunity for change is here, and typical of American protocol, now that game time has arrived, the players are wrestling with the enormous responsibility, looking for the book of rules, a coach, the referee, and the score card—a strategy so that the best possible outcome can be achieved.

The game revolves around the debate over the use of fresh surface water found in our American rivers. Every aspect of the rivers is involved, including the control of quantity, quality, regulation, and benefits. This debate is generated by the ability to plan and specify the operation of each dam, existing or future, in a comprehensive plan for the basinwide benefits of the river. One by one, new dams are being proposed, and the operation of each dam and reservoir is being debated as existing dams become eligible to be operated for all beneficial uses. Every aspect of every reach of every river is subject to the debate at the proper time. This is a tremendous debate that will fix the environment of the rivers for the next generation.

Federal agencies play a large role in this debate, particularly those within the Department of the Interior. Many of their responsibilities have been legislated by Congress. Now, as many dams are coming up for relicensing, it is time for these agencies to step up to the plate and face their

responsibilities. It is up to them to represent the citizens, provide all of the pertinent information, and ensure that the rivers will be operated for the benefit of present and future generations.

The Debate as a Contest

What exactly is the debate? The arguments center around the cause and effects of the dam. Obviously, when a dam is constructed, the natural river regime is changed. A stretch of the river becomes a reservoir rather than a flowing stream. The looks of the country are changed with the construction of the dam. Historically, the change caused by dams is considered detrimental to the local environment. Water raised behind the dam has potential destructive energy, but it also has a number of potential uses, including consistent water supply for domestic use, firefighting, irrigation, municipal use, industrial use, stock watering, and wildlife; enhanced fishery habitat; flood control; ground-water recharge; hydroelectricity; improving water quality; interbasin transfer of water; logging; mining; off-stream storage; recreation; scenic values; transportation; and wetlands.

There are segments of society that are opposed to any dam, and there are segments of society that want more control of the rivers offered by the construction of dams. But the largest debate is over the operation of the dam. Environmental damage can be controlled by sensitive operation of the release of water from a dam. The conservation of water can become a liability if the release of the water causes downstream damage. Operation of an existing dam can make the structure a liability or an asset, depending on the operation scheme of water release.

The debate is over how to use the dam as an asset rather than a liability—to change the operation to the best multiple-purpose dam for the most beneficial uses. The debate occurs at the local (preliminary), State (intermediate), and Federal governmental (tournament) levels. The contest is to find solutions—to arrest or correct problems threatening the sustainability of the rivers. The success of the effort is scored by the new operation of the dam, and the cumulative effects of the process on beneficial returns. The scoring will continue long after the initial debate is finished and the new operations schedules are in place. Conceivably, if done correctly, the result will be a "win-win" negotiated plan.

The Objective of the Game—Defeating a Creeping Crisis

Almost every region in America is faced with fresh water problems:

> "The problem is not the supply of water. The problem is simply people - our increasing numbers and our flagrant abuse of one of our most precious, and limited, resources" (Graves 1993).

Each region's situation is distinct and it has been difficult to tackle the problems with a consistent national policy. The problems in some regions are reaching crisis levels, but because they are not national problems, the crisis is confined to local solutions. This approach does not always result in finding the resources to correct the regional problem. Furthermore, as the problems are becoming worse in more regions, the crisis is creeping to other regions.

Procedures to tackle that part of the crisis caused by the fresh water flowing in the rivers is provided by national policy. This national policy simply states that: 1) dams have such significant values that they should remain in Federal ownership, 2) after they have been constructed and paid for, they will become multipurpose dams, and 3) dams will be operated for multiple uses for the benefit of the public. This report describes how the policy was created, how it should work, and the roles of some of the principal players.

The contest offers opportunities to reverse current trends— to defeat the degrading circumstances threatening the fresh water flowing in our rivers. The contest empowers the American people to take control of the circumstances and manage the rivers through control of the dams, rather than reacting and blaming others for the problems.

Game Time—Relicensing Timetable

Game time occurs every time that a new dam is considered for development or every time a dam becomes eligible for new operational schemes. Under the Federal Water Power Act (FWPA), which was amended and is now called the Federal Power Act (FPA), construction of public dams by non-Federal entities is authorized by the Federal Power Commission (FPC), now known as the Federal Energy Regulatory Commission (FERC), by means of a license. The license has a lifespan of 50 years, and at the end of that time, the dam can be removed, taken over by the Federal Government, or relicensed.

For every dam built under the provisions of the FPA, there was a plan that the dam would be debt-free after 50 years. Debt-free means that the agency constructing the dam has paid off all financial debt incurred by the construction, operation, and maintenance of the public dam; has met the requirements of the license; and has received the agreed-upon benefits. After that, the public dam is available for any beneficial purpose or to meet the needs of the people. The timetable for debating the operation of the dam is before it reaches its 50-year anniversary, so that the decisions are reached at the time of relicensing.

There are cases where several dams are all considered at one time during the debate for efficiency and to ensure a comprehensive approach. This works to evaluate the basinwide approach and demonstrate how each dam is to be operated for the cumulative benefits of the river. In such cases, the timing has to be negotiated with the agencies involved and with FERC.

Participants in the Game

The Players

The players in the licensing debate are the citizens of the United States. These citizens may be represented as individuals, any association of individuals, any corporation organized under the laws of the U.S., any municipality, or local, State, or U.S. government. Citizens have often formed groups to enhance their concerns and their perspectives—which is an integral concept of American government. Employees of associations and corporations can argue that they represent the citizens and are meeting their needs, as evidenced by public support. Employees of government agencies can argue that they are being paid by the citizens to carry out a mandate of the citizens. The mandate comes through legislation, regulations, and court cases that control the actions of government employees. Every player of every group is representing the citizens and their best interests.

Principal groups of players can be identified, but not every group is playing all of the time. However, it may be helpful to identify the groups that seem to be involved most of the time. Following are typical descriptions of the players; the list is not intended to be comprehensive.

Individuals

The interests of individual citizens are most important, but often, when they are described as part of a group, individuals seem disinterested. Typical citizen involvement begins with a personal interest. Citizens bring a perspective that must be considered, and their issues are often the same as larger issues that are represented by groups. Groups listening to the individual citizens are more effective if they can point back to the individuals they represent. However, there are individuals that choose not to let groups speak on their behalves.

Corporations

By definition, a corporation is a group of individuals organized under the corporation laws of the U.S. Generally, they are thought of as moneymaking business organizations or organizations legally recognized as having liabilities distinct from those of its members. Without specifics, they are individuals banded together, focused on one business venture, and officially recognized as a group rather than an association of individuals. These corporations bring a business sense to the negotiating table and a perspective of the business interest of the public. Corporations are likely to represent the nongovernment development and marketing of hydroelectric power.

Associations

As the citizen develops a personal interest, there is a tendency to join other citizens of like interests. Some associations have massive enrollment and are actively challenging corporations and government officials. County, irrigation, and transportation associations often advocate the benefits of structural developments, but rarely are there associations for water supplies for domestic use, firefighting, municipal use, industrial use, and stock watering; flood control; ground-water recharge; interbasin transfer of water; logging; mining; and off-stream storage. An almost constant advocate of waterpower is the National Hydropower Association. On the other side of the debate are the associations of every resource that could be or has been damaged by the flow regime of the rivers. There are associations for wildlife, enhanced fishery habitat, improved water quality, recreation, scenic values, and wetlands.

Municipalities and Local Governments

Municipalities and local governments represent the specific, everyday impact of river operation on individuals, corporations, and associations within a specific reach of the river. These representatives of the citizens must be consistent players, and their thoughts and perspectives must be carefully considered. They represent government, and although they may have local perspectives, they bring facts to the argument.

State Governments

State governments represent larger issues and river segments. They generally have the responsibility for managing the water and its quality in the streams. Even though they may struggle with the Federal Government over control, they remain significant players, and they must become part of the debate to balance their interests with the interests of neighboring States (upstream or downstream). State governments also have scientific and engineering expertise that is essential to making scientific recommendations.

U.S. Government

Unlike other countries around the world, the U.S. government has chosen not to be the stewards of the rivers. The State governments were empowered in the Constitution; the role of the Federal Government has been legislated and debated in the court system. Based on legislation (act by act), the requirements have been interpreted and regulations have been issued specifying the roles of the executive branch of the government. The court system brings relief to the citizen when the regulations or the actions of the government do not reflect the wishes of their chosen representatives in Congress Case law).

Roles of various government agencies will be explained further, but the Corps of Engineers (COE), Environmental Protection Agency (EPA), Fish and Wildlife Service (FWS), and FERC, are mandatory players in the relicensing debate. Other significant agencies having major responsibilities for the successful relicensing debate include the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Geological Survey (USGS), USDA Forest Service (FS), National Marine Fisheries (NMF), National Park Service (NPS), and Soil Conservation Service (SCS), which is now the Natural Resources Conservation Service (NRCS). These agencies are involved only when their specific responsibilities are part of the problem or the solution.

The Coach

The designated leader of the process is the Secretary of the Interior. The Department of the Interior (DOI) is intentionally positioned to champion the interest of the public and prevent special interests and single perspectives from running the game. The Secretary of the Interior has specific legislated responsibilities in this role and must coach the agencies involved to achieve a winning process. Congress chose the Secretary of the Interior to preserve the waterpower and reservoir sites, to be an integral part of the FPC, and to have authority over FERC license requirements. Further, six of the twelve Federal agencies that are actively involved in the process are under the Secretary of the Interior (Secretary).

The Secretary must exercise bold action to provide leadership during the process, assigning the proper players and sufficient players from the staff to resolve sectional water problems. Every action must be planned, coached, practiced, and executed to achieve a win-win solution.

The Referee and Scorekeeper

The referee at the final tournament is FERC, which is charged with reshaping the operation of dams for multipurpose, beneficial uses. Those issues that make it to the final tournament must be substantiated through an administrative record of the previous debates. FERC manages the licensing and relicensing rulebook, starts or stops the licensing action, and issues the final score (the conditions of a license) when the game is over.

Setting Up the Playing Field—Background and Legislated Structure

Before the debate begins, it is helpful for all of the players to know the rules of the game and how they were developed. The ruled are founded in legislation, and though the background and events leading to the legislation are quite complex, they are important to understanding the game and how it is played today.

Water Law

Immigrants from Europe colonized on the rivers, which provided them with a fresh domestic water supply, supplemental water for irrigation, and natural transportation corridors. In Europe, the *Riparian Doctrine*—the tradition that landowners along the river (riparian owners) had beneficial use of the river, as well as some responsibilities for protecting the waters of the river—prevailed. Techniques for diverting waters out of the stream had been developed, and instream uses had been recognized and debated.

However, the "new" nation wanted to establish its own policies, and the first demand of the people was that the Federal Government was not to interfere (*laissez faire*). In a break with European tradition, State governments were given ownership of the rivers. Laissez faire policies promoted independent interests rather than planning and orderly development. Mill seats and flood control structures were constructed without regard for upstream or downstream neighbors, and irrigation projects were not properly planned and designed, making them subject to structural failures and tremendous liabilities. State policies were compromises of fragmented legislatures, each seeking favors for their own constituencies. Counties, drainage basins, and commerce each had different needs for water development and competed for funding to gain commercial advantage. Laissez faire policies failed—they left it up to the courts to reconcile conflicts between one developmental use of waterways and another.

One of the most substantial breaks from European tradition occurred in the California Acquisition with the discovery of gold in 1848. The miners needed water to wash material from the heavier gold, but were not interested in purchasing the land to obtain use of the streams. The miners developed *"local customs"* in each camp, which simply allowed them to use the streams to their benefit, without an established right. The State government recognized these customs and developed the *Doctrine of Prior Appropriation*, which allowed for streams to be used on a "first-come-first-served" basis. Water became as much of a commodity as land, minerals, trees, crops, and livestock, and as such, it was exported out of the streams and sold to miners who didn't have holdings along the rivers. This started a revolution of new ideas on how to exploit the rivers for commercial applications and introduced other problems as well.

The Doctrine of Prior Appropriations did not carry the long-term responsibility of land ownership or concern for the rivers, and because of this, another harmful practice was occurring—hydraulic mining operations were using the rivers for waste disposal. In addition, the use of water as a commodity was causing public concern over the availability of water for consumption. Some of the mining camps were dewatering and moving whole streams, removing any sense of security on the dependability of water supplies, making it necessary to establish a national ranking of water uses.

> "Statutes and court decisions both recognize that water should be devoted to its highest use, and the laws of many States provide for the condemnation of an inferior use in the interest of a higher one. Such laws generally recognize a municipal or domestic use of water as the highest which may be made, because of its necessity in the support of life. Next in order comes the use of water in agriculture for irrigation, whereby the available food supply is affected. The use of water for power, though important and valuable, is inferior to either municipal use or use for irrigation and may, in general, be condemned if necessary to insure higher utilization. The greatest value of a source of water supply at any particular time will depend, however, on the demands for domestic or municipal use, on the proximity of a tract of arable land adapted to agriculture, and on the quantity of power that may be developed and the availability of a market for it. Such value may change with the development of the country, making necessary the abandonment of established industries in order that the water may be available to supply a greater need. Changes in use will, however, follow the economic law, as the damage to established industries must be paid for, and to that extent the cost of the water for other use will be enhanced" (Smith and Others 1913).

In the early 1900's, interbasin transfers were allowed in order to meet the needs of the growing population in the West and to address problems brought on by periods of drought. Water was moved from its original streambeds to rivers that were closer to the population. Interbasin transfers solved many short-term municipal and State problems and contributed to the acceptability of dams.

"Large-scale water development was becoming more and more a form of regional development through transbasin diversion. Interbasin transfers of water, of course, are an old story in American water resources development. The possibility of tapping the water surplus of the Sacramento River at the Sacramento-San Joaquin delta to aid the water-deficient San Joaquin Valley was studied as early as the 1870's as part of a plan for coordinated development of California's Central Valley; later it formed the core of the Central Valley Project and the State Water Plan. Diversions out-of-basin have been made for a variety of reasons—for irrigation in the semi-arid West, as in the Colorado-Big Thompson project (1938), or to solve a pollution problem, as in the Chicago diversion from Great Lakes to Mississippi drainage. On a major scale, however, the search for out-of-basin sources of water is intimately linked with the growth of big urban metropolises, and with the increasing urbanization of the country as a whole, especially along its eastern and western seaboards. The sequence can be traced in New York's progression from the Croton water system (1842) to the Catskills (1915), to the Delaware Basin (1950's), and in Los Angeles' progression from the Los Angeles River (outgrown by 1905) to the Owens Valley (1913), to the Colorado River (via the Colorado River Aqueduct, 1941). Today, more than half of all the water that traverses drainage basin divides in the United States is destined for municipal and industrial use, and one can predicate the expansion of water resources development by nonbasin units upon urban metropolitan growth."

Ludwik A. and Eileen Teclaff (Goldman 1973)

Water policy became even more complicated when the courts began allowing a "*reasonable use*" version of the Riparian Doctrine. Because the mill seats were in the public's or States' interest, the courts allowed injury to other owners, and even allowed pollution.

"For example, in *Pennsylvania Coal Co. v. Sanderson* (1886),30 the Pennsylvania Supreme Court found that pollution of a stream by a coal mine to the detriment of a lower riparian was a permissible use. The court stated:

> The plaintiff's grievance is for a mere personal inconvenience, and we are of the opinion that mere private inconvenience arising in this way and under such circumstances, must yield to the necessities of a great public industry, which although in the hands of a private corporation, subserves a great public interest.

The court neatly disposed of natural flow requirements that a lower riparian is entitled to receive water in an unchanged condition, with the words:

> It will be observed that the defendants have done nothing to change the character of the water, or to diminish its purity, save what results from the natural use and enjoyment of their own property. They have brought nothing onto the land artificially. The water as it is poured into Meadow Brook is the water which the mine naturally discharged. Its impurity arises from natural, not artificial causes."

Ludwik A. and Eileen Teclaff (Goldman 1973)

However, stream and river pollution eventually became a national problem. The States were not in the financial position to clean it up themselves, and they did not have the power to force the mining companies to clean it up. Using streams and rivers for waste disposal led to cholera, typhoid, and other diseases. Chlorination was introduced in 1908, which reduced the costs of treating municipal water supplies, making it possible for widespread usage.

"Many other cases from the later nineteenth century and early twentieth century, which were brought on grounds of injury to the navigable capacity of rivers, reveal the damage done to the aquatic environment. The total amount of rubbish deposited in the nation's waterways must have been truly staggering. Take, for example, *Clark v. Peckham*:

> A municipal corporation cannot turn its sewage into a navigable water way in such a way as to *fill it up* [emphasis added] to the injury of navigation.

Or *New York v. Baumberger*:

> A city is entitled to an injunction restraining the discharge of mash from a brewery through the sewer into a navigable river the free use of which for purposes of navigation is impeded by diminishing the depths of water so that vessels will be prevented from coming to the city's wharves, thereby depriving it of dockage and wharfage.

Or *McKeesport Gas Co., v. Carnegie Steel Co.*:

> Equity may restrain a riparian owner on a nontidal stream from depositing slag, cinders, or other refuse below low-water mark and from filling in or otherwise making the slope of the bank from lower water to high water line more than 1 foot to 3 feet—that is, 1 foot rise to 3 feet horizontal distance, if such conduct will tend to fill in the stream and interfere with navigation."

Ludwik A. and Eileen Teclaff (Goldman 1973)

From the beginning, downstream users needed protection from depletion of waters, and eventually, this led State governments to make formal agreements, called *interstate compacts,* with each other. The State governments exercised their authority and passed laws retaining authorization rights. They started regulating use in order to protect the public interests of their jurisdiction. They also began agreeing with neighboring States on the quantity of waters passing from the upstream State to those lower in the basin.

Dam Development and Technology

The Doctrine of Prior Appropriation opened the doors to broader water applications, the Reasonable Use Doctrine lessened the rigidity of the Riparian Doctrine in favor of development, and State regulation through appropriations and compacts was conducive to development:

- *Navigation.* Because transportation could make settlement of the interior possible and could increase the value of the public lands, construction activities received public aid almost immediately. The State governments moved into a major internal improvements program beginning with New York's commitment to build a navigation canal between Albany and Buffalo. Other States followed the lead, and the natural river system of transportation was supplemented by a system of artificial canals. The canals were constructed to facilitate trade between interior and coastal cities.

- *Flood Control.* When the settlers reached the Mississippi River basin, they quickly recognized that the Mississippi River provided a monstrous new challenge in the form of flood control. Public debate ranged from whether forests contributed to flood control to whether reservoirs or levees were the best control to whether channelization would solve the problems. John Wilson of the General Land Office (GLO) recommended correcting the existing dike system, channelizing, and reopening some of the natural bayous. However, it did not make sense to help Louisiana build levees on one side of the river without helping Mississippi on the other side. The Act of September 28, 1850 (9 Stat. 519), provided that the proceeds from the reclaimed land be used exclusively for levees and drains. The improvements along the Mississippi, which were made by the respective States, were indeed flood control projects.

- *Mining.* The mining industry developed "hydraulic mining" techniques, as well as extensive dams and reservoirs, canals, and eventually irrigation systems to grow vegetables for the miners. Without safeguards, the primitive systems were hazards; their failures caused extensive damage and "wars" among the miners. Techniques improved as investors realized the value of the water systems and constructed expensive, elaborate control structures. By 1872, the largest of the reservoirs created a lake 2.5 miles long that covered over 500 acres. The dam was constructed of cedar and tamarack. Eventually the water became more valuable than the declining gold reserves.

- *Irrigation in the West.* Much of the land west of the hundredth meridian could not support colonization without irrigation. The Mormon colony was the first English-speaking colony to break out across the hundredth meridian in 1847 and set up successful irrigation practices in what is now Utah. Other colonies were established, but

ignorance of irrigation practices led to high development costs, overselling of the water, and litigation. Irrigation companies and private charities tried to promote colonization in irrigation-dependent areas, but the cost of providing water was higher than expected, and the efforts often failed.

By 1860, the lands with inexpensive irrigation potential had been developed. New investments were spurred when the Federal Government formally recognized local custom water rights and allowed for rights-of-way across public property. The Federal Government also subsidized construction of railroads across the West through land grants. Railroad companies, and in a few instances the railroads themselves, classified the lands, constructed irrigation works, transported settlers and equipment, planned cities, opened new markets, and spurred investments to promote the selling of their land. Private irrigation companies appealed to Congress and the States for massive land grants, but few were granted, and some companies failed. By 1871, land granting practices were discontinued. When the Homestead Acts, including the Desert Land Act of 1877, were passed, the land and ditch companies filed false homesteads and acquired land at homesteading prices. But irrigation systems had to be built, causing the downfall of many private companies. The depression of the 1890's, lack of first-class irrigable land near water, lack of sufficient profits, and insufficient public control over feasibility and safety of projects all contributed to the failure of corporate irrigation by 1900.

Several State governments founded policy and initiated irrigation projects in the 1880's and 1890's. California established a State Engineer position to investigate problems with irrigation, drainage, navigation, and mining debris. The State Engineer recommended constructing reservoirs, dikes, and levees, and in 1880, the Debris Law was passed to impose a tax to create revenue for a construction fund. Initial construction was destroyed by flood and fire, which broke any unity in support of a State plan; the law was overturned and the Office of the State Engineer dismantled. The competition for water development funds, questionable authority of State projects, and the impression that the State was bailing out the mining industry all contributed to the failure of California's water policy. In 1889, Colorado passed legislation to allocate funds from the internal improvements fund to construct reservoirs and canals, but the canals were very expensive and were never completed. The State was criticized for funding too many projects and for not having sufficient hydrographic surveys. The internal improvements fund ran low and the legislature abandoned the reclamation program without funding to maintain the existing dams. In 1899, the State turned control of the dams over to the respective counties.

- *Hydroelectricity.* Advances in technology for generating and transmitting hydroelectricity allowed waterpower to be used in locations other than "mill seats."

Generation facilities could be located at water drops, and electricity could be transmitted to mills, factories, and communities located at more convenient sites. This technology, coupled with the convenience of using waterpower rather than coal or other resources to generate electricity, led to an increased demand for waterpower.

- *Developing Dam Technology.* Though wheelbarrows and mules were still the principal means of moving earth to construct levees and embankments for controlling water in 1900, the Industrial Revolution greatly impacted the technology for building dams. Improvements in dynamite and the inventions of blasting caps and reinforced concrete, coupled with mechanical earthmoving equipment, allowed more dams to be built in 20 years than had been built during entire dynasties in ancient history. Hydroelectricity provided crushers, sawmills, concrete plants, and lights for construction of large dams. Damsites that used to be impossible to build because of physical conditions were no longer off limits. It was possible to build dams large enough to create sufficient storage to change the flows in larger streams and rivers. During the drought of the early 1930's, the acceptance of dams was greatly enhanced.

"Technological as well as political factors became conducive to a more concerted effort to control the nation's water resources early in the twentieth century. Several advances combined to greatly increase the economic and technical possibilities for water development. Increased mechanical power started revolutionizing earth moving, improvements in the production of concrete made it possible to build large dams in locations once considered impossible sites, new construction techniques helped lower costs, and improvements in electricity transmission made it easier to match the power potential of large dams with the electricity demands of the cities and factories. These developments contributed to rapid increases in both water use and dam construction" (Frederick and Sedjo 1991).

Withdrawal of Land

In 1888, Congress gave the USGS responsibility for finding, evaluating, and reserving all dams in the West that might be needed for irrigation reservoir sites. This was the beginning of 20 acts requiring the preservation of dams for reservoirs or hydropower. The acts were passed to cover different situations that held opportunities to keep the dams in Federal control. In addition to irrigation reservoirs, acts were passed for hydropower sites and reservoir sites, for hydropower and reservoir sites on Indian land, for dam designations on land prior to granting it to the States through statehood acts, for military reservations, and for revested railroad lands.

However, these same acts, accompanied by 10 others, required USGS to discover the locations of potential dams, make an independent scientific assessment of their value, publish their findings, and consider the site in a basinwide scheme—all before reserving the land through a withdrawal. The USGS findings were published and made available to the public.

Federal Water Power Act

After 40 years of debates, Congress gained consensus from all interests and passed the Federal Water Power Act (FWPA), now called the Federal Power Act (FPA). The FPA made the Federal Government responsible for licensing, building, maintenance, safety, and new operation schemes of dams. This responsibility included assessing the needs of the public for dams, reservoirs, and hydroelectricity, and dealing with existing and future dams accordingly (Appendix A).

In order to gain a consensus of Federal interests, expertise, and regulatory power at the time of licensing, the FPA established the Federal Power Commission, which included the Secretaries of Agriculture, the Interior, and War. All of the Federal dam-building expertise and land and other resource management functions were consolidated under this Commission.

Though the intent of Congress was that the Secretaries would work cooperatively, competition among members of the original FPC had started long before the FPC was formed. When dam-building technology surpassed the capabilities of even State governments, Congress had stepped up to build large public works dams for regional benefits and initially authorized one dam-building agency to develop public works for navigation purposes (COE). However, later when Congress decided to build irrigation structures, they chose the Department of the Interior to develop another dam-building agency (BOR), focusing on the differences of purposes rather than the similar construction technology. As circumstances changed in the West, Congress found themselves having to choose between building an irrigation dam that would also be used for debris control (BOR), or a debris control dam necessary to aid navigation (COE). This happened in California, and Congress found their two dam-building agencies in competition for authorization to build the same dams (Reisner 1986).[a] Now these two agencies were part of the FPC.

When the FPC sought comprehensive planning, the original task was assigned to the COE, which developed a series of comprehensive basinwide reports. Although approved by the President, the reports received criticism that they only addressed the COE's interests and were slanted toward achieving the COE goals. The other dam-building agency then had to create another set of basinwide reports to promote its programs.

Even though the dam-building agencies were under the direction of a Secretary, they each had their own Congressional supporters, and they were receiving direct authorization from Congress

to build dams that Congress felt were needed. Power and money flowing from Congress kept the Secretaries from control of these two agencies. After 10 years, the FPC was made an independent commission, called the Federal Energy Regulatory Commission. The Secretaries relinquished their operation of the original Commission; however, they did not relinquish their responsibility or authority (Appendix B).

Subsequent Legislation

While the FPA did constitute a comprehensive plan for waterpower and reservoir resources, the other resources negatively affected by dam development did not have such a plan. Further, the plan applied to non-Federal Government development of dams, and the Federal Government's own dams were not adhering to the idea of a basinwide approach. Congress received pressures from environmental interests and subsequently passed significant legislation.

Water Resource Planning

Members of Congress arguing for integrated planning passed the Water Resource Planning Act, which was aimed at optimum development of the nation's natural resources through coordinated planning, and increased State participation in such planning. It was also an attempt to remove the pork-barrel approach to waterpower and reservoir resources development by forcing a systematic planning procedure. It reflected the pressure against single-purpose planning that was building in Congress.

> "In order to meet the rapidly expanding demands for water throughout the Nation, it is hereby declared to be the policy of the Congress to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal Government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned."
>
> (79 Stat. 244)

The act created a Water Resources Council, composed of the Secretaries of the Interior, Agriculture, Army (the same players as on the original FPC); the Secretary of Health, Education, and Welfare; and the Chairman of the FPC (now FERC). For planning purposes, this act required biennial assessments of the adequacy of water supplies to meet water requirements;[b] establishment of principles, standards, and procedures for preparation of regional or river basin plans for formulation and evaluation of Federal water and land resources projects; and submission of comprehensive, coordinated, joint plans for water and related land resources

development in the area, river basin, or group of river basins. The act provided for levels of planning, from regional to site-specific.

Although the intent of Congress was clear, the success of this act has been limited. Even under the authority of this act, integrated planning was not happening, and the reports were recommending contradictory solutions, becoming a platform for individual and group propaganda. The Water Resource Planning Act is still on the books, but is completely ignored and unfunded.

In 1967, Congress established a National Water Commission to study the causes of conflict between environmental quality and development of the nation's water resources and to recommend possible solutions. Upon completion of that study, reports from individuals who were dealing with the conflicts that frequently accompany major water developments was compiled and published (Goldman 1973). The report made recommendations pertaining to technology, land use planning, and impact analysis (Appendix C).

Coordinated Planning

In another attempt to require coordinated planning and to keep isolated, special-interest planning from occurring, Congress passed the National Environmental Policy Act (NEPA) of 1969. Although it addresses another aspect of the problems, it also requires systematic, interdisciplinary cooperation and planning, and pertains to private development on Federal land and to all Federal agencies. Under NEPA, Congress specifically required environmental consideration and understanding of the ecological systems and natural resources. NEPA was to be administered by a new agency, the Council on Environmental Quality (CEQ).

NEPA has gained strength through its amendments and administration. The Environmental Protection Agency, formed by the provisions of the act, has become a planning enforcement agency. Under the provisions of NEPA, land management agencies must consider integration of their land administration planning with rights-of-way planning. This is an enforceable phrase that keeps waterpower and reservoir resources from being ignored.

Land Use Planning

Congress chose to continue altering existing planning requirements and forcing more players into coordinated planning—they were revising the game rules through legislation. First, Congress inducted the Forest Service in 1974 under the Forest and Rangeland Renewable Resources Planning Act of 1974 (Public Law 93-378, August 17, 1974, 88 Stat. 476-480). The law states that the Secretary of Agriculture shall prepare a Renewable Resource Assessment, a comprehensive and appropriately detailed inventory of renewable resources, and develop land

management plans. BLM was drafted in 1976 under Public Law 94-579 (October 21, 1976, 90 Stat. 2743), the Federal Land Policy and Management Act (FLPMA). FLPMA consolidated some of the Secretary's authority to make, modify, revoke, review, and extend withdrawals, and precluded delegation of this authority to heads of bureaus and offices. It did *not* revoke the authority for locating, assessing, modeling the site on a basinwide scheme, and publishing the information, though these functions were later moved from USGS to BLM by Secretarial order. FLPMA also required inventory of lands and their resources values, and with public involvement, development of land use plans. Both agencies were required to do systematic comprehensive planning for the use of Federal land.

Each of these acts with their amendments has requirements for multiple use and sustained yield. When resource values are not compatible, systematic conflict resolution is required as part of land use planning. These acts complement the Water Resource Planning Act of 1965 and the National Environmental Policy Act of 1969.

> "Creative application of technology encompasses the responsibility to plan, design, and construct systems that will not only solve the immediate problem, but will be sensitive to long-term interactions that sustain affected natural resources. Thoughtful development does not need to affect the environment adversely. Development can be long-term, efficient, effective and ecologically beneficial—in a word, sustainable."
>
> *Arthur E. Williams* (Reuss 1993)

The Rules of the Game

The rules of the game emerged from the complex debate over waterpower and reservoir resources, which started after the Civil War and continued to the passage of the FWPA. The rules are found in Federal legislation, regulations, and case law, and are summarized below.

Rule No. 1—Science Will be Used in Decisionmaking

After the Civil War, Congress was facing a new dilemma—the land in the western territories was an immense expanse and posed very difficult, distinct, regional challenges to the status quo. The California mineral discoveries and development challenged the very principles of land ownership, mineral rights, and water law. Discoveries in other territories led to a sort of anarchy throughout the West. In 1866, Congress passed a right-of-way law to permit the use of government land without ownership. From the passage of this law until the Act of March 3, 1879 (20 Stat. 394), almost every concept of traditional law in the U.S. was debated. What prevailed was a concept new to government—using modern science to make better governmental choices. The U.S. government authorized the scientific exploration, resource identification, and scientific classification of land as to its highest and best use. Concurrently, Congress decided that, based on the recommendations of the scientists, certain lands would be held by the government for future generations.

In addressing the Joint Commission of the Senate and House of Representatives on December 5, 1884, Mr. John W. Powell, the Director of the Geological Survey, challenged:

> "You are to decide for the people the best methods of utilizing the results of all scientific research, as they pertain to the welfare of the people of the United States."

Congress did decide, and legislation that requires the use of science in the debate was passed.

Rule No. 2—Damsites are to Remain in Federal Ownership

Land issues involving the use or purchase of lands for dams have been clearly decided. The dams of the U.S. belong to the government and they are not available for purchase. They are available for development by authorization of Congress, lease, or right-of-way.

On June 12, 1866 (14 Stat. 64), Congress granted the rights to use public land for a dam, canal, mill site, and other purposes to a private corporation. This was the first of a series of right-of-way acts permitting use of land for dams and power. The second right-of-way act (July 6, 1866) followed within months; it applied to existing developments on Federal land and made

provisions for future developments. These acts were interspersed between withdrawal acts that reserved the dams in Federal ownership.

Based on the scientists' recommendations, Congress was debating just how the laws should work. The initial right-of-way laws were not sufficient. The development community was seeking ways to get around the security and the intent of the right-of-way laws. It was becoming a practice to acquire the Federal land under other patent laws, and then to develop the dams. If this was an innocent practice, then no harm was done. But, Congress was being informed that the practice was deliberate, that corporations were defrauding the government and trying to monopolize the damsites. The practice was forcing Congress to face the issue of retaining the ownership of the damsites for future generations (their bequeath value).

In 1888, Congress passed a withdrawal act under which all irrigation reservoir sites belonged to the government and were not available for patent under other land laws. Over the next 32 years, Congress passed a series of 19 additional acts providing the President, the Secretary of the Interior, and USGS the responsibility for finding, evaluating, and keeping the remaining significant dams on Federal land. There are a large number of private dams not affected by this policy, because Congress chose not to confiscate, condemn, or purchase private dams.

Approximately 4.9 million acres of lands have been set aside to ensure that constructed and potential dams remain in Federal ownership. All of these damsites were assessed by scientists and the results published before the classifications, designations, reserves, and withdrawals were formalized by either the President, the Secretary of the Interior, or the Director of the USGS.

The statement of the Secretary of the Interior in the Congressional Record of 1915 is a very concise reiteration of the rules prevailing at that time:

> "Should the Government allow its dam and reservoir sites and other lands valuable for power development to pass from its hands forever?"
>
> "(1) It has been the policy of Congress from the inception of power development in the United States only to grant permission to use such lands and not to sell or give away the lands in perpetuity. Acts of Congress of May 18 [sic 14], 1896 (29 Stat. 120); February 15, 1901 (31 Stat. 790); February 7, 1905 (33 Stat. 702); May 1, 1906 (34 Stat. 163); and, March 4, 1911 (36 Stat. 1253)."
>
> "(2) The general law applicable to the use of public lands for the development of electrical power, the act of February 15, 1901, authorizes the grant only of a permission to use public lands and reservations for this purpose, expressly providing that any such permission may be revoked by the Secretary of the Interior, or his successor, in his discretion, and shall not be held to confer any right or easement, or interest in, to, or over any public land or reservation. The general law now in effect relative to granting of rights of way for transmission lines, the act of March 4, 1911, only permits the approval of such rights of way for periods not exceeding 50 years."
>
> "(3) The future of water power is as still unknown. It promises to be an invaluable resource; (a) because it replaces itself, while coal and oil do not; (b) because it can be transported at slight expense and for long distances; (c) because the development of numerous other western resources, low grade ores, irrigation of arid lands by pumping, and the establishment of manufacturing enterprises are dependent upon cheap and abundant electrical power."
>
> "(4) To at this time grant such lands in Perpetuity to private corporations or individuals is as to divest the Federal Government, as well as the several States, of a large measure of the control which it might otherwise exercise over this resource by law or regulation and would place beyond its power the opportunity of providing by law such different method of use or disposition as the future may show to be best adapted to the public interests."

This rule was solidified in the FWPA of 1920. In the provisions of the act, Congress gave new authority to the FPC to lease the land of the U.S. for the construction of waterpower dams and simultaneously withdraw the affected lands from going to patent. Each of the Secretaries had veto power over land that they administered, but was accountable for reserving the dams and ensuring the orderly development of the rivers.

FWPA Rules

Dams were recognized as a very unique, valuable resource, so the debate over the rules was extensive. Use of science was the first rule, leasing of the resource and not ownership was the second rule. Springing from those basic rules was a series of complicated considerations and new rules found in the FWPA. Some of the debates over the rules began formally in 1914, but the informal debates stem from the debates creating the February 15, 1901, right-of-way act.

Conditioned Use

Four years after the passage of the 1901 right-of-way act, the forest reserves were transferred to the Department of Agriculture (February 1, 1905). At the time of transfer, the Secretaries agreed that the Forest Service could grant temporary permits (including waterpower right-of-ways). Immediately, the Forest Service drew up a standard permit agreement which attached conditions to the right-of-way to protect the public interest. These conditions were debated for the next 10 years.

> "The Forest Service drew up a standard permit agreement which it required all users to sign. It contained the following terms: an easement of definite tenure; a time limit for the easement, determined by the Secretary of Agriculture to suit the needs and magnitude of each project; a requirement that construction be completed in a definite and reasonable time to prevent speculation; and an annual charge of an amount the Secretary might deem proper and change from year to year as circumstances might warrant" (Kerwin 1926).

Uniform Regulations

The Forest Service conditions were only one aspect of the debate. The debate concerning public vs. private control of waterpower sources stimulated the Act of June 21, 1906 (Chapter 3508, 34 Stat. 386-387). This act provided uniform regulations for the development of waterpower and, at the same time, made it easier and cheaper to improve navigation. President Roosevelt gave a message to Congress on April 13, 1908, which provides a more comprehensive statement of his advocation of the provisions of the FWPA (Appendix D). It was the start of the debate that lasted 12 years.

Interim Use

A very important aspect of the debate centered around waterpower values. An argument was advanced that the lands for future dams and reservoirs could be used during the interim. The Commission was given the authority to determine what kinds of uses would be allowed and to

control the circumstances of interim use. They immediately issued determinations that uses such as forestry and grazing could be permitted at any time—that they posed no threat to the waterpower values. The Commission determined that other uses, such as recreation uses or highways, would not harm the waterpower values if they were removed without expense to the licensee. A third type of determination was made that uses such as petroleum extraction could harm dams and the Commission decided that they would review each situation on a case-by-case basis.

Split Estate

The fourth type of determination authority given to the FPC concerns a separation of the waterpower values from the land values. Congress chose that mineral values belong to the Government. They allowed what is called a split estate, where the lands can be patented with a reservation in the title that the mineral values discovered on the land belong to the U.S. Following the example of separating the mineral values from land, Congress made the same provision for waterpower values. When requested, the Commission could determine that the proposed use of the land would not harm the waterpower values. This determination, under the provisions of Section 24 of the FPA, then allows the Secretary of the Interior to issue title to the land with a reservation in the title keeping the waterpower values in Federal Government ownership.

Playing the Game—Developing the Administrative Record

Though the game is already in progress, and has been since the debates started in 1879, now it is time for this generation to play—to play according to the current rules and under the current conditions. Congress has mandated that planning must occur as part of the game. Congress has also identified certain entities that must participate in the game and has legislated their assigned roles and positions. Now all that is needed to get the game underway is to bring all the players together to work toward the common objective of managing the rivers in the public interest.

Play begins by developing an administrative record that is acceptable to FERC, the scorekeeper. FERC requires an administrative record from every player in order for each player's efforts to count. The administrative record is documentation of how the game is played—it must include records of hearings, public meetings, and more formal proceedings, and it must describe the available information, the information used, how the information was used, who participated in the debates, a summary of the debates, and any conclusions or decisions made. It also documents the prescribed actions to follow and any other needed actions.

The key to winning the game is to get all the players to work as a team. Every player must participate to build the administrative record. And all the players must work together to represent the public interest and avoid duplication of effort. With effective teamwork, the players can advance to the next level of play and develop a winning administrative record that is acceptable to FERC.

The formulation of the administrative record begins with the facts of the situation—an inventory of all pertinent facts.

Record the Problem

A logical starting place is a careful assessment and documentation of existing and anticipated problems. Congress has already passed legislation (79 Stat. 244-254) requiring biennial assessments (national, regional, and basinwide). Without this step, the entire debate is subject to wandering from a common objective. Conceivably, the problems are known, but to reveal and distinguish between problems and perceptions, wants, and opinions is a difficult task. Individuals, corporations, associations, municipalities, and County, State, and Federal governments must participate in problem formulation. Problem formulation requires value judgements and priority setting. Traditional priorities for fresh water were human consumption, human food production, and human benefits, in that order. In this era, these priorities are being challenged (or forgotten). Federal, State, County, and municipal governments, as the official representatives of individuals, corporations, and associations, must clarify and state actual priorities.

Record the Objective

If the objective of the game is to solve current fresh water problems and anticipated problems for the next 50 years, the solution starts with the statement of the problem. As stated earlier, common regional problems involve people and their abuse of limited resources. A statement that the debate will solve people abusing fresh water resources is oversimplified. A statement that the process will optimize available supplies for the solution of fresh water problems is ignoring the segment of the population that does not want to optimize the resource. A realistic objective is simply to bring the best science and the best ideas to the table for debate. The next step is a commitment toward orderly planning for sustainability and multiple use. All of these steps are required by Congress, but gaining commitment from the players requires teamwork. The teamwork is achieved by consensus of the players under the active direction of the coach.

Record the Physical Setting and Resources

If fresh water resources are the focus of the debate, then the administrative record must show the facts about these resources. All of the readily available physical facts belong in the administrative record. Basic information (not just statistics) concerning the weather, which is considered the source, must be understood. Physical facts on geology, slope, soils, and vegetation, must be known to understand how precipitation is accumulated into streams with the quantity and fluctuation that has been observed. Some interaction between the surface water and the ground water is usually necessary to fully understand the full quantity of the resource. Existing lakes, wetlands, riparian areas, and dams alter the quantity and fluctuation of the resource. Human interaction with the resource needs to be documented, including where and when water is being removed, used, or returned to the lakes, wetlands, reservoirs, or streams. Past human activities that may influence the water quantity also need to be documented. These same factors must also be documented for water quality. Historians can help uncover practices of manufacturing, mining, burying wastes, or flushing wastes in rivers, which could be influencing water quality today.

If the administrative record of the objective includes orderly planning, the entire cause and effect of the environment and human interaction must be studied and applied to specific solutions for specific problems. If there is not enough information to understand the cause and effect of the interaction of humans and the environment, the administrative record should show what scientific principles were applied by which individuals to arrive at the best solutions available. Multidisciplinary perspectives, including historians, economists, geographers, and people who have studied political science—people with skills not associated with water resources—may provide valuable insight to this interaction (Reuss 1993).

Resources represented by scientists and engineers are important to understanding the cause and effect of the interaction between humans and the environment. Science and engineering thrive on interdisciplinary synergism. Science can provide facts to keep decisions realistic. Engineering principles can provide structure and order to focus decisions on manageable alternatives. When there are no scientific solutions, engineers use science to guide judgements for making land management decisions. Efficient, economical science and engineering depend on teamwork among skill specialists. Each debate should involve a critical mass of resource scientists, technicians, mapping scientists, architects, engineers, technical writers, and editors to be the most efficient. Every effort needs a core of scientists specializing in local fisheries, hydrology, recreation, and wildlife. Congress recognized this fact, and the United States is the first government in the world to try using science, engineering, and technology to produce better land management decisions.

> "What are the engineer's contributions to the problem-solving team? I suggest two important roles, one unique and the other shared with other disciplines. The unique role is technical expert. It involves planning and designing facilities, operating systems, and providing expertise in dispute resolution and regulatory forums. This role demands innovation, finding new solutions to complex technology-based problems, adapting computers to management, and engineering research. . . . The shared role is integrator and problem solver, serving as the leader of interdisciplinary teams to reduce complexity and mitigate conflict in water management. . . . If these two roles, technical expert and integrator, are filled well, engineers can be key players."
>
> *Neil S. Grigg* (Reuss 1993)

Record Structural Resource Options and Values

Part of the administrative record is the information about developed and potential damsites. FERC, BOR, and COE will furnish information about their dams and interests in dams in the planning area. BLM hydraulic engineers will furnish information about USGS studies, active interests in structural solutions, and a basinwide perspective. BLM will also furnish survey information, land records, and when public lands are involved, land management options. Incidental information BLM may furnish includes topography, geology, hydrology, land status, and models of the undeveloped dams.

A listing of potential and existing dams is insufficient information. The record needs to show what effect these structures have on the quantity, quality, and fluctuation of the surface water resource. Specifically, records on existing dams needs to explain how the dams have been operated and the effect of the operation on streamflows. FERC and the operator of the dam, BOR or COE, need to educate the players (the public) on the condition and safety of the dam.

Next, the players need to know the different options of operating the dam. Because most of the problems may be regional, these options need to be scoped regionally, and the influence each dam could have individually or corporately if operated on a basinwide operation scheme needs to be determined. This is the start of regional, basinwide planning as mandated by the Water Resources Planning Act. The administrative record should include the basinwide planning documents of BOR and COE.

Record the Debate

Earlier, the administrative record was defined as documentation of how the players played the game. Reason dictates that the administrative record begins at the first games and records the successes as play progresses. The first games are played at the municipal government level; they then proceed to the State level, then the Federal level.

A team effort must begin at the local level. The traditional team concept is that **all** team members are available to help **any** team member. NEPA compliance requires coordinated land use planning. State and Federal governments need to participate and **help** the local municipalities. Documentation of this participation demonstrates qualifications of the record. If the municipal land use plan is going to be consistent with the State and Federal plans, the State and Federal agencies must educate, participate, and above all, listen for compatibility. There may need to be negotiations, consensus building, and dispute resolution at this level in order for the plans to be compatible, and all of this should be documented. Such actions score points with FERC and help build an administrative record that will be unchallenged.

Levels of Play

Development of the administrative record occurs at several levels: municipal, State, and Federal. Each level of planning builds on the previous level, so it is important that the administrative record be prepared efficiently and effectively from the start. In addition, there is also a large amount of overlap between levels of planning. Consequently, involving all the team players from all levels at the beginning of the process will eliminate duplication of effort, reduce costs of having to redo what has already been done, and increase the chances for achieving a winning result.

Preliminary Playoffs—Municipal Planning

Preliminary play revolves around land use planning, conflict resolution, environmental impact assessment, and selection of alternatives at the municipal level. Every time a municipal land use plan becomes due for review or update, the preliminary games are being played. Any proposed action not covered in the existing land use plan, such as proposals for a new dam, relicensing of an existing dam, or payoff of contracts for a Congressionally authorized dam, triggers a review or an amendment to the land use plan. These normally occurring events provide opportunities for debates and for revising the land use plan to reflect coordination, cooperation, and compliance with other counties and with State and Federal land use planning.

Municipalities and local governments represent the specific, everyday impact of river operation on individuals, corporations, and associations within a specific reach of the river. It is the municipal land use plan that presents their thoughts, perspectives, and facts during the debate. Ideally, planning starts with the empowered public, making choices at the local level. However, local planning documents need to reflect the rules that regulate their options. State and Federal governments are required to be consistent with local planning and therefore must become involved.

Progress can be difficult when an individual competes against a government agency, a corporation competes against an association, or one County formulates a plan without input from their neighbor. Progress requires awareness, understanding, training, listening, and negotiation—every people skill available to reach a point of agreement on what is the best possible plan. Progress depends on people coming into agreement, with every perspective thinking that they have won for the public rather than for a biased perspective or philosophy presented in a scientific management plan.

Land use planning must debate and discover **all problems** of all options, whether they be structural or nonstructural. The debate must start at the municipal level. Resource debates are expected over factual issues; impacts on the well-being of associations, corporations, and municipalities; and social values. Factual issues are best resolved by improving the amount and

validity of relevant information. Professional and technical specialists, such as planners and engineers, are good sources of factual information if they are disinterested—if they are not perceived to be involved in related interests or social value issues.[c]

If all perspectives are heard, land use planning will produce opportunities out of discussions. These opportunities may include further structural solutions (instream or off-stream). During these initial games, each potential dam option should be considered as possibly meeting each demand. Each demand should have possible structural solutions. Each problem should be identified with acceptable mitigation or enhancement requirements. If done properly, every opportunity will be identified and evaluated for those with interests in development.

The impacts on the well-being of individuals, associations, and corporations revolve around conflicts between beneficiaries and cost bearers.[d] Mediation between these interests is important so that potential losers are compensated by potential gainers and everybody comes out no worse off than before. Social value conflict revolves around broad social issues such as fairness, importance of environmental values, and equal distribution of gains from economic development. Resolution of social values is found in legislation or litigation. If the game rules cover the situation, awareness and understanding may resolve the conflict. If the game rules need to be changed for resolution, new legislation or litigation is required. All these conflict resolutions need to be documented in the administrative record.

Environmental impacts must also be represented in the administrative record. Each dam and potential dam will affect the environment in specific ways. The impacts must be inventoried, assessed, and debated. In the past, possible damsites were selected and then environmental impacts were assessed. Congressional legislation requires the assessment of all the dams to facilitate the choice of the best location. The Federal Government has a mandate to find, scientifically evaluate, and retain control of every damsite in the U.S. that may be needed in the future. Use of the land use planning process makes this process even more efficient than Congress imagined. In a comprehensive land use plan, the best structural alternatives are identified and considered under the selected alternatives.

Every dam and/or reservoir that has been constructed or needs to be constructed is a benefit and a liability to the rivers. Each dam's value increases when it is operated cooperatively with other dams on the river. Conversely, each dam's liability is decreased if its operation becomes more flexible due to cooperative operation. Consequently, a comprehensive plan must include flexibility for cooperative operation.

Intermediate Playoffs—State Planning

The intermediate games are played at the State government level through the formulation of the State land use plan. When there is an application for investigation, construction, or relicensing, critical play by the State government involves its fish, wildlife, and water resources management agencies. The applicant must obtain necessary water rights and work with State governments to determine environmental impacts on water quality and to obtain State permits. Before the application is accepted, the applicant conducts environmental studies and obtains reviews from the necessary resource agencies.

In order to capture the individual citizen's concerns about their river, the concerns will need to be documented and tied to river stretches. The everyday impacts have been documented in the local government's land use plan. However, the State plan is much more than a gathering and reflection of County opinions. As the river flows from one County to the next, fresh water problems change, water rights change, and environmental concerns change. It would be naive to expect each County's land use plan to complement the next County's plan.

Conflict resolution at this level has another dimension. Resource debates over factual issues become debates of multiple parties, all with some degree of expertise. Adjacent counties may argue with adjacent counties, or even counties upstream or downstream. Different counties may have different information sources or have reached different conclusions from the same information. And County employees may have different perspectives than the resource specialists employed by the State government. State land use plans may provide opportunities to include County perspectives of the impacts on the well-being of associations, corporations, municipalities, and the County. Some of the associations' and corporations' perspectives may include several counties, which may help the mediation process. However, resolving the conflicts between beneficiaries and cost bearers, particularly if they are County governments, requires objective, skilled mediation.

The State government and its administrative record have the opportunity to demonstrate leadership in the area of social value conflict. The solutions are available, and most solutions have been legislated or litigated since 1879. Conceivably, the State role is that of educating on existing regulations, and, if necessary, new legislation or litigation. Leadership is demonstrated through the people skills of the educators, scientists, and mediators.

In the past, the development of State plans for waterpower and reservoir resources has been unique to State planning. These plans may be useful for facts and information; however, few, if any, included impact analysis.

Final Tournament—Federal Planning and the FERC Licensing Process

There are two major playoff brackets in the final tournament—Federal land use planning and the formal FERC licensing process. Tournament players include the winners of playoff brackets and invited participants. Unless the facts and administrative record are aggregated from the first games, the tournament players are doomed to lose or to have to overcome the lack of administrative record at much additional expense.

FERC, as scorekeeper, has the same legislative and regulatory control as other Federal agencies. When FERC receives a comprehensive land use plan, it must consider the alternatives and recommendations of the plan. The land use plan is part of the administrative record. If the game is played by a team with the common objective of correcting fresh water problems, the scorekeeper remains a scorekeeper. If the game is not played well and the administrative record does not reflect comprehensive planning, FERC must assist the licensee (whether it's for an original license or for relicensing) in creating another environmental impact statement. The scorekeeper becomes a player by default. FERC is required to make a last heroic charge at resolving conflicts and developing an environmental impact statement and a comprehensive plan for each river. If FERC becomes a player, there is a role reversal, and the Secretaries of Agriculture and the Interior become the scorekeepers.

The FERC licensing process involves preapplication consulting, formal application filing, and NEPA compliance. The need for preapplication consulting arises from the incorrect assumption that stakeholders are incapable of resolving relicensing issues among themselves. Consequently, preapplication consulting involves providing a forum for conflict resolution at the river basin level and using collaborative or cooperative teams of stakeholders to scope issues, design studies, and analyze impacts and best ways to mitigate or enhance damages.[e] It also involves supporting "nontraditional" approaches to formulate an administrative record that documents the issues of Indian tribes; Federal, State and local governments; and associations, corporations, and the public. Preapplication consulting makes FERC responsible for providing education, scientists, mediators, dispute resolution, and regulatory forums for the difficult cases.

The licensing process begins with formal application filing. FERC accepts three types of applications. If the applicant wants the right to investigate the feasibility of a hydroelectric development without committing themselves to construction, they may obtain a Preliminary Permit. Secondly, FERC accepts applications for a license to construct, operate, and maintain hydroelectric facilities. This application may include an exemption of the license regulations if the development meets the rules. The permits and license create an automatic Federal land withdrawal to protect the rights of the permittee. The third application is for relicensing of an existing project and is submitted before the original license has expired.

None of these permits and licenses, if issued, allow the permittee to ignore planning and conformance to NEPA. It is the responsibility of the permittee to work with County, State, and Federal land managers. It is the responsibility of the permittee to obtain necessary permits and land use authorizations, and to coordinate, consult, and comply with legislation and litigation. The permittees are the playmakers, and the rest of the team is following their signals.

FERC has carefully documented the regulations and requirements for the instruction of the permittee. When a corporation decides to investigate, develop, or relicense a dam for hydropower, all of the actions previously described are set into motion. If the County, State, and Federal land use plans do not already reflect the impacts of the action, they must be revised or amended. The NEPA document covering the corporation's action is to comply with the others.

Under FERC's rules, the applicant must consult with resource and management agencies and hold public hearings. An applicant must consult with NMFS, FWS, NPS, EPA, the Federal land administering agency, any Indian tribes that may be affected by the project, and State government fish, wildlife, and water resources management agencies. They must obtain necessary water rights and work with State governments to determine environmental impacts on water quality and obtain State permits. Before the application is accepted, the applicant must conduct environmental studies and obtain reviews from the necessary resource agencies.

When the application is accepted, FERC reviews the administrative record and determines whether tournament play is ready to begin. When ready, FERC issues a public notice, and the formal debate begins. Any individual, association, corporation, or government agency may protest or ask for special considerations at that time.

Licensing requires compliance with NEPA. NEPA requires Federal agencies to eliminate duplication of State and local procedures and to prepare the required documents jointly. Noncompliance with NEPA results in either repeating previous efforts or ignoring crucial information. As a Federal agency, FERC normally takes the lead in preparing documents that comply with NEPA. Efficiency dictates that Federal land management agencies and FERC work together to prepare these documents. However recently, the rules have been changed to allow the preparation of these NEPA documents to be contracted.

Strategy for the Win

Winning at the licensing game requires a strategy that addresses the complexity of the process and complies with legislation. Perhaps the best strategy is to encourage team play, involve the required participants at the start of the process, and provide effective coaching in order to develop an umbrella environmental impact statement that becomes part of the administrative record. A successful administrative record of these games is very hard to overcome at the time of licensing or relicensing.

Coaching responsibilities rest with the Secretary of the Interior. Coaching helps develop game plans, establishes plays, assigns roles, assigns positions, and encourages players to play using each other's strengths. Without coaching, every player is in a reaction position—everyone fends for themselves, land use plans are revised independently, and the perspectives of the other players are ignored. Coached teams build the administrative record systematically for the most effectiveness. They practice so the best record is built in the most efficient way, and they work for the best solutions for the public and the nation's rivers.

Many other legislated responsibilities fall within the Department of the Interior, so Interior agencies need to become proactive and get involved early in the debate. Since its creation, Congress has looked to Interior to accomplish a variety of tasks (Utley and Mackintosh 1989). The Secretary of the Interior has a diversified staff to accomplish these assigned tasks, and this staff could be molded into a formidable team to tackle the licensing debate. Still, the Department of the Interior cannot stop the creeping crisis by itself. However, the Interior team could become a core for a larger team. Adding players to a core usually forms winning teams—at least it provides a foundation from which to build a team.

Municipal Planning

Traditionally, municipal government planning has not had assistance from the other players. However, compliance with legislation dictates a change. Regulations call for joint preparation of environmental documents. The strategy at this level would be for Federal agencies to get involved with the local government's process in preliminary play, rather than waiting until the final tournament and then asking the local government to get involved. Teamwork at the local level benefits all other team play because it is at this level that the real assessment and documentation of the existing and anticipated problems begin. It is here where the Department of the Interior must reveal and distinguish between problems and perceptions, wants, and opinions. Individuals, corporations, associations, municipalities, and County governments must participate in problem formulation. The record of the physical setting, available resources, options, and values is made at this level. Efficiently participating in land use planning at this level produces the needed administrative record and avoids the costs of recreating the record entirely at the Federal Government's expense later.

Federal agencies should approach citizens, municipalities, and local governments—the groups that form local planning teams—as customers, offering information, education, and scarce skills to promote effective plans. Federal agencies are responsible for the inventory and scientific assessment of resources under their protection and have been funded to provide inventories, scientific evaluations, and criterion necessary for multiple use, sustained yield, environmental consideration, and understanding of the ecological systems and natural resources. Federal agencies can easily come to local planning as team players, bringing science and their perspectives for the benefit of the public.

Participation by Federal agencies at this level is important to ensure that waterpower and reservoir resources are considered in land use planning. **All** public interests must be represented in the debate in order to discover the local opinion about the projected change in operations on local jobs, cost of hydroelectricity, economics, and environmental concerns. Comprehensive planning is required to balance all demands with available options in consideration of the future. This applies to structural solutions as well as environmental concerns.

Partnership development of land use plans will help obtain an unbiased perspective. Traditionally, land use planning has carefully considered popular, political, and vocal individuals, groups, associations, and corporations. The plans become a platform for advancing philosophy rather than a scientific management plan. In other words, currently the national environmental voice is louder than the local economic development voice. Documented experience states that long-term planning must be scientific and flexible. Immediate societal wants and needs have to be balanced by engineering projections of future requirements.

Problems arise if those with an interest in the development of a new dam are reluctant to come to the debate. The Department of the Interior has responsibilities for the dams and needs to bring their expertise to the table. The agencies responsible for planning are not aware of all the problems that need to be solved. The absence of any voice dooms comprehensive planning to failure. As soon as the development of a new dam becomes eminent, a new redundant planning process is required. Efficiency dictates that comprehensive planning is accomplished whenever planning is required.

There are three key rules call for the Department of the Interior to develop partnerships with local governments during planning: FPA, FLPMA, and NEPA:

- FPA allows non-Federal development of hydroelectric facilities. Individuals, corporations, and local governments apply to FERC for licenses to investigate, construct, or relicense a dam. If any part of this project involves Federal land, there is an automatic withdrawal of the Federal land. As BLM is the Federal land recordkeeper, BLM is immediately involved. BLM represents Interior's responsibilities for waterpower and

reservoir resources, and since such an action is the beginning of development of the resource, BLM is further involved. BLM has a responsibility to look at multiple use and sustained yield. For dam resources, this means investigating multiple purposes and uses on a basinwide scheme for the maximum benefit of all users, and ensuring that any existing structure and any new structures are contributing to solutions of fresh water problems. If the site is above BLM-administered land, the connection is obvious—the streamflows on BLM lands will be affected and BLM is an interested party. BLM also has responsibility for inventorying other potential dams and determining their strengths and weaknesses. BLM is an advocate of the development of the best new site available, or the best possible operation of existing dams to fit a basinwide scheme.

- FLPMA mandates that BLM develop land use plans that consider all resources, including waterpower and reservoir resources. BLM already has the mandate to inventory and assess the bequeath value of the sites, identify their weaknesses and strengths, and make this information available to the public. Partnering with local government means sharing this information, educating, and participating each time they do land use planning. Such teamwork builds the first part of the administrative record sponsored by the local government.

- NEPA requires that any environmental impacts of the investigation, construction, or relicensing be consistent with other planning and environmental documents. The coordination clauses of NEPA require consultation with any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Involvement with local planning builds the coordination and administrative record for these required comments. FERC, under the conditions of FPA, requires the applicant to consult with FWS, NPS, the Federal land administering agency, and any Indian tribes that may be affected by the project. All of these are Interior agencies, although they are not involved in every case.

The Secretary of the Interior, as the coach, can form and provide training for interdisciplinary teams to work with local planners to provide a complete, unbiased assessment of environmental effects. Interior can provide resource specialists to the team to fill in the gaps at the local level. The team will help document the problems, objectives, physical setting, resources, options, and values in each of the five impact assessment categories, which include physical, biological, economic, aesthetic, and social aspects of the environment. The coach can use the team to develop the impact analysis to aid the planning process. Having a playbook that describes the full range of environmental effects likely to be involved in the typical actions will make these efforts more effective and efficient.

These interdisciplinary teams can also help educate local planners to help ensure that Federal interests are not lost. The coach can simply include multidisciplinary perspectives, such as historians, economists, geographers, and people who have studied political science—people with skills not associated with water resources.

State Planning

Federal agencies wanting to score in the FERC relicense debate and those with land use planning requirements of their own must participate in round two of the debate—State land use planning. Their participation is not to promote a Federal agenda, agency, or policy, but to educate State land use planning teams on Federal legislation, executive policy, and agency interests, and to contribute their experiences and information so that the State plan will reflect the most accurate perspective of the facts, the information presented, the applied science, and how the game was played.

As the Department of the Interior becomes partners with local land use planners, the facts and alternatives will be clarified. This will relieve the State planners from some conflict resolution duties so they can focus on their designated responsibilities. However, because the conflict resolution duties are so important, the coach may need to supply experts in people skills and mediation. A major role for the Federal Government as a player is providing expertise in dispute resolution and regulatory forums.

The core Interior team may need to assist the State governments in the same ways it assists local land use planners. It is possible that Federal employees could be used by State governments as technical experts, integrators, and problem solvers, serving as the leader of interdisciplinary teams to reduce complexity and mitigate conflicts in water management.

Interior's team may need to encourage the State governments through education and examples to use impact assessments in making their land use plans. The umbrella environmental impact statement will be useful to State governments, and will be readily acceptable if the Department of the Interior develops it with the State government's participation. Having an umbrella environmental impact statement in place will bring structure and completeness to the integrators, problem solvers, mediators, and educators. Because all of these conflict resolutions need to be documented in the administrative record, the umbrella environmental impact statement provides a structure for the tournament and for FERC.

Federal Planning and the FERC Licensing Process

Federal agencies must become involved and participate in local and State government land use planning and incorporate dams and reservoir resources into Federal land use plans. Conflict

resolution at the river basin level is a rightful Federal Government responsibility. Only at the Federal level can comprehensive planning cover the entire river basin. Only at the Federal level can the benefits obtained from upstream dams be credited and the downstream benefits be calculated. Issues require the perspectives of local and State governments, but can only be resolved at the river basin level.

Congress has provided that specific Federal agencies will play in the formal relicensing debate. USGS and NRCS are candidates for the Department of the Interior's team—the scientists and information provided by the USGS may be crucial to a successful team effort. BIA and FWS may also be candidates for the Interior team when certain issues are involved. However, even with the teamwork of local governments and State governments, an Interior team may not be able to resolve major problems. Other Federal agencies, such as COE, EPA, FERC, FS, and NMF, all have mandatory roles in the debate and must become involved.

Competition for starting positions is healthy, but competition between players during the game is not healthy. Some of the competition among these five agencies has already been described. There is also potential for competition between the Secretaries of Agriculture and the Interior. Interior's conditioning requirements could create competition between the BLM and the FS before the FERC. The waterpower withdrawals on FS lands are as much of a reservation as the FS reservation. The Secretary of Agriculture has responsibilities to shape FERC licenses for the benefit and consideration of the other resources in the National Forests. The Secretary of the Interior has responsibilities to shape FERC licenses toward the waterpower and reservoir resources. At one time, as members of the Commission, the Secretaries were formally cooperating. Today, both Secretaries have expanded responsibilities from when they were part of the Commission. However, recent case law has recognized the expanded roles are included with the original intent. Common responsibilities include complementary land use planning, complementary NEPA documents, and building adequate administrative records for their conditioning authority. The Interior team must participate in the FS land use planning procedures to build the effective administrative record.

The expertise, perceptions, and help of all of these Federal agencies are necessary to the game. These Federal agencies have an overall perspective that is not found elsewhere, with the exception of national associations that represent their interests. It is a coaching challenge to bring all of the players from these agencies into the team and to develop a game plan, such as an umbrella environmental impact statement. Interior may develop its own umbrella environmental impact statement, but it will not be comprehensive. An objective playbook, which describes the full range of environmental effects likely to be involved in the typical actions of investigating, constructing, or relicensing a dam could focus the players on the common objective of solving major fresh water problems. Fresh water problems are somewhat regional, and even if regional umbrella environmental impact statements were prepared, costs

would go down while quality would go up. This type of approach was recommended by the Council on Environmental Quality.[f]

Agreements with associations under an umbrella environmental impact statement can save money. Agreements with State governments where several dams are up for relicensing would also be cost-effective. Agreements with regional or Statewide corporations, such as hydroelectric companies, have the same potential but are less hopeful. Any of these coaching innovations would win more contests and certainly raise the quality of play for the scorekeeper.

An umbrella environmental impact statement and agreements with associations, corporations, and States would also apply in right-of-way issues. Rights-of-way have been issued for dam and reservoir development outside of Congressional authorization. They are still used today, if the development does not meet the requirements for FERC licensing. Under the provisions of the Energy Policy Act of 1992, BLM has authority to issue rights-of-way over new FERC projects on BLM lands. The consistent factor remains—the issuance of a right-of-way requires the development of an environmental impact statement, which has to be consistent with municipal, State and Federal land use planning.

Coaching an effective Interior team completely changes the final tournament. Coached teams will be proactive and build the administrative record during the preapplication process and leave the scoring to FERC during the formal process. The preapplication process includes the normal public hearings, the environmental impact assessment, and subsequent decisions, with FERC performing quasijudicial functions. With coaching, there is no longer a need for preapplication consulting, which presented an impossible workload for FERC. The FERC staff must review the application and issue a Notice of Filed Application. Conceivably, there will not be any protests or requests for intervention. FERC, or a contractor, can simply adapt the already prepared environmental documents. There will not be a need for recreating any of the administrative record, public comments and protests should be minimized, and the entire procedure will become a certification of the administrative record.

This can happen only if the Secretary of the Interior exercises the authorities and responsibilities that are already assigned. This administration is encouraging the Federal Government to reinvent Government processes to become responsive to the public. This debate offers the Secretary the opportunity to champion the interest of the public and prevent special interests and single perspectives from scoring the most points. Every action must be planned, coached, practiced, and executed to achieve a win-win solution.

Appendix A

Provisions of the Federal Water Power Act

Following the order within the FWPA, here is a comprehensive list of rules about dam resources that were established by the FWPA.

Power of Authority, accountability, and enforcement:

- Issue licenses for construction, operation and maintenance.
- Issue permits for investigations of the resource.
- Make rules and regulations

Rules for the Applicants:

- Necessary information for understanding of the proposed project.
- Evidence of compliance of State laws.

Conditions of the License:

- Project must be adapted to a comprehensive scheme of development.
- Project should not be altered, except for emergency.
- Project will be maintained.
- Excess profits shall go into reserves.
- Licensee shall pay annual charges.
- Licensee shall pay other developers for upstream benefits.
- Prohibits restricting the output of electricity or other methods of increasing electricity costs.
- The FPC may waive conditions of this act except the 50 license period.
- Conditions of navigability.
- Licensee must commence timely construction.
- The U.S. may take over the project with two years notice, after expiration of license.
- After the expiration of the license the FPC may relicense the project.
- The U.S. may take over the project in times of war or other specified times and conditions.
- Proceeds from Indian Reservations are to be credited to the Indians.
- Other charges will be paid to the treasury, subject to prescribed distribution.
- Series of rules governing electric rates and service to the public.
- Right of eminent domain if necessary.
- Right to extend the date of termination.
- Consideration of existing valid existing rights.
- Withdrawal of effected lands in the project.
- Separation of Waterpower rights from land titles.
- Compensation of improvements on lands patented without waterpower rights.
- Consequences of noncompliance.

Appendix B

Escondido Decision Quotes

May 15, 1984, Supreme Court decision concerning ESCONDIDO MUTUAL WATER COMPANY, ET AL, PETITIONERS *v.* LA JOLLA, RINCON, SAN PASQUAL, PAUMA AND PALA BANDS OF MISSION INDIANS, ET AL.

Note: Under the Act of June 10, 1920 (Federal Power Act; Chapter 285, 41 Stat. 1063; 16 U.S.C. 791-823), the Secretary of the Interior shall remain responsible for a major role in determining what conditions would be included in order to protect the resources under their respective jurisdiction. Under the provisions of Section 4(e) of the Federal Power Act, the Federal Energy Regulatory Commission shall include the conditions the Secretary deems necessary.

The May 15, 1984, Supreme Court decision has the following insight into the necessity of the a new planning authority for WRR resources:

> "In 1920, Congress passed the Federal Water Power Act [*June 10, 1920, Chapter 285, 41 Stat. 1063; 16 U.S.C. 791-823*] in order to eliminate the inefficiency and confusion caused by the "piecemeal, restrictive, negative approach" to licensing prevailing under prior law. *First Hydro-Electric Cooperative v. FPC*, 328 U.S. 152, 180, 66 S.Ct. 906, 919, 90 L.Ed. 1143 (1946). See H.R. Rep. No. 61, 66th Cong. 1st Sess. 4-5 (1919). Prior to passage of the Act, the Secretaries of Interior, War, and Agriculture each had authority to issue licenses for hydroelectric projects on lands under their respective jurisdiction. The Act centralized that authority by creating a Commission, consisting of the three Secretaries, vested with exclusive authority to issue licenses" 52 LW 4590, Slip op. at 7.
>
> "Congress was no doubt interested in centralizing Federal licensing authority into one agency, but it is clear that it did not intend to relieve the Secretaries of all responsibility for ensuring that reservations under their respective supervision were adequately protected" 52 LW 4590, Slop op. at 7.
>
> "Between 1914 and 1917, four bills dealing with the licensing of hydroelectric projects were introduced into Congress, none successfully. In 1918, a bill prepared by the Secretaries of War, Interior, and Agriculture, at the direction of President Wilson, was introduced. H.R. 8716, 65th Cong., 2d Sess. (1918). It contained the language of the 4(e) proviso basically as it is now framed. Because of the press of World War I and other concerns, the legislation was not enacted until 1920" 52 LW 4590, Slip Op. at 7, Footnote 15.

"It is thus clear enough that while Congress intended that the Commission would have exclusive authority to issue all licenses, it wanted the individual Secretaries to continue to play the major role in determining what conditions would be included in the license in order to protect the resources under their respective jurisdiction. The legislative history concerning section 4(e) plainly supports the conclusion that Congress meant what it said when it stated that the license "shall ... contain such conditions as the Secretary ... shall deem necessary for the adequate protection and utilization of such reservations" 52 LW 4591, Slip op. at 9.

"All parties agree that there are limits on the types of conditions that the Secretary can require to be included in the license: the Secretary has no power to veto the Commission's decision to issue a license and hence the conditions he insists upon must be reasonably related to the protection of the reservation and its people" 52 LW 4591, Slip op. at 11.

"... the Commission's authority and responsibility under section 10(a) to determine that "the project adopted ... will be best adapted to a **comprehensive plan** ... for the improvement and utilization of water-power development, and for other beneficial uses." 16 U.S.C. s 803(a)" 52 LW 4591, Slip op. at 12, Footnote 21.

"Even if the Commission is not required to comply with all of the requirements of section 4(e) when it issues such a license, it is still required to shape the license so that the project is best adapted, among other things, for the improvement and utilization of water-power development and for "other beneficial purposes, including recreational purposes." 16 U.S.C. s 803(a). In complying with that duty, the Commission is clearly entitled to consider how the project will affect any Federal reservations and to require the licensee to structure the project so as to avoid any undue injury to those reservations." See Udall v. FPC, 387 U.S. 428, 450, 87 S.Ct. 1712, 1724, 18 L.Ed.2d 869 (1967)" 52 LW 4593, Slip op. at 18.

"The Federal Power Act constitutes a **complete and comprehensive plan** ... for the development, transmission and utilization of electric power in any streams or other bodies of water over which Congress has jurisdiction under its commerce powers, and upon the public lands and reservations of the United States under its property powers" 52 LW 4594, Slip op. at 20.

Appendix C

Recommendations of the National Water Commission [1]

As the regional fresh water problems become worse, the creeping crisis must be solved to meet individual regional needs. To customize solutions, recognized, general information on the problems and solutions must be considered. This knowledge is considered when deciding what possible solutions may need to be applied toward specific regional problems. The report by the National Water Commission provides a perspective of the kind of problems to expect when considering balancing environmental concerns and needed structural solutions to specific problems. It provides a review of the complexity of the issues and, therefore, good information for consideration. Even though the publication is 25 years old, most of the studies were very forward and are applicable. Technology has advanced since the study, but the recommendations for using technology remain valid.

The report recommends collecting the following kind of information for total land use planning, because it "provides a data base essential for evaluating any planning proposed thereafter and may well deliver the least cost and most benefit for a desired objective."

- Public attitudes and values
- Complete inventories of "natural and cultural processes covering climate, geography, physiography, ground water hydrology, pedology (soils), plant ecology, limnology, and cultural history."
- "The social values associated with these categories were assessed. They included agricultural resources, developable resources (construction limitations), ground water supply limitations in areas requiring protection, historical resources, scenic resources (in closed places, visual bowls, long views), as well as surface water resources."
- "All prospective land uses related to a watershed resource and possible future alternatives were analyzed."
- "Rate all of these resources by classification for physical, cultural, and social values.
- "A synthesis overlay map was prepared showing land use alternatives and recommended allowable land use."
- A detailed list of the consequences of building the project, which includes considerations of changes in the stream ecosystem, loss of cultural heritage, disruption of major

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[1] All references cited in these Recommendations are to papers contained in the original volume: Goldman, Charles R., editor, Environmental Quality & Water Development, W.H. Freeman and Company, San Francisco, California, 1973.

highways in the vicinity, and the inevitable acceleration of urbanization around the project.

This report recommends the use of impact analysis during the planning stage of a project. Mr. Gilbert F. White, University of Colorado, Department of Geography, now retired, identifies the 12 traditional decisionmakers and three types of participants in the more complex networks. The lists are included because they continue to be recognized as powerful groups. In Environmental Quality & Water Development, Mr. White's report recommends the planning process clarify issues with better identification of goals, a better appraisal of impacts of proposed alternatives, and public participation in decisionmaking.

> "Decisions as to how, where, and when water is manipulated in the United States are chiefly the result of the working and interaction of twelve major networks of decision makers. These are: (1) farmers and suburbanites who develop their own domestic supplies; (2) ranchers and Bureau of Land Management offices who improve stock water on grazing lands; (3) farmers, irrigation districts, Bureau of Reclamation offices, and legislators; (4) farmers and drainage districts who drain agricultural lands; (5) freight carriers, TVA, and Corps of Engineers offices and legislators who improve waterway transport; (6) municipalities and franchised companies providing municipal water; (7) municipalities disposing of urban waste; (8) private companies supplying their own water and disposing of their own waste; (9) municipalities, levee districts, TVA, and Corps of Engineers offices and legislators controlling flood flows; (10) private and public hydroelectric power producers; (11) municipal, State, and Federal operators of water-based recreation; and (12) farmers, Forest Service and Soil Conservation Service offices carrying out watershed management." (Page 158)
>
> "In the more complex networks we may distinguish three types of participants: (1) the planners who are responsible for preparing and carrying out water development works; (2) individuals affected by such works either directly or indirectly; and (3) the administrative-political officers who act as mediators between the planners and the affected groups as public opinion develops with regard to any particular action or its consequences." (Page 159)

In order to involve more customers into the decision process, more information and education must be planned. When Kenneth Henwood and Carole Coop wrote a chapter titled, "Impact Analysis and the Planning Process," they described how to use impact analysis for such purposes. They describe the aim is to produce a study sufficiently comprehensive to educate the public and technically persuasive to influence the decisionmakers. The study should integrate public values and interests into the planning process. Documented impact analysis provides the

information for more informed decisionmaking on the part of its representatives, both legislative and administrative. They further list categories covering the broad spectrum of information required for complete impact analysis. "These five categories for impact assessment include physical, biological, economic, aesthetic, and social aspects of the environment. The physical and biological categories contain most ecological impacts and the broad range of socioeconomic effects is covered in the other three." The authors propose that interdisciplinary teams will have to be formed and trained for a complete, unbiased assessment of environmental effects.

The full set of recommendations from this report are as follows:

RECOMMENDATIONS

I. *Public participation in planning must be greatly increased in order that human and environmental values may be given more nearly appropriate weight in balancing the engineering and purely economic aspects of water development.*

In considering water developments, there arise questions of public values necessitating public judgments and participation in the formulation of development alternatives. There are encouraging signs that governmental agencies are moving toward fuller public participation, and this trend should be encouraged and intensified along the lines of subsequent recommendations. Real public involvement is the best antidote to the prevalent attitude of frustration, cynicism, and disillusionment concerning governmental institutions. Such involvement increases public confidence in decisionmaking and will do much to reduce the divisive political conflict common in the development field. (Allee and Chapman; Beeton; Fox; Hedgpeth [Bodega Head]; McCloskey; Ross; Swan; White.)'

1. To eliminate one of the key weaknesses in present water resource planning, public participation should be sought at the outset so that viable alternatives may be generated. In the past there has been an unfortunate tendency for development agencies to present the public with single, take-it-or-leave-it plans, for communication with the public to be in the nature of salesmanship rather than two-way exchange, for hearings to be scheduled in various ways to prevent the full participation of groups representing an interest in environmental values, and to rise overall practices which result in development along narrowly conceived lines.

In the future, we must make possible real choices among real alternatives (including that of no development). To this end, proposed developments should be well publicized and comment should be invited from groups and individuals representing consumers, conservationists and preservationists, and the public at large. (Edmondson; McCloskey; Swan; White.)

2. In addition to direct participation of the public, which is essentially a political aspect of the planning process, perhaps even more can be accomplished through what can be thought of as indirect participation—the use of various techniques to measure and incorporate attitudes and value judgments. To this end there is pressing need for increased research in the field of environmental attitudes and opinions. Existing survey data are adequate only for tracing the gross outline of the changes in attitudes toward the environment, and many important details remain to be understood. Research support is necessary to continue present studies and encourage new ones in the quantitative and overlay methods dealing with aesthetics and other social aspects of the natural environment. (McEvoy; Swan; White.)

II. *Evaluation of proposed water development projects must go far beyond traditional methods to include analyses of aspects of the social and natural environment that can be assessed with new innovative techniques.*

Water development is too important to be undertaken without knowledge of all its potential effects. Present planning methods depend largely upon economic and engineering evaluations which are far too narrow in conception and method. Progress to date on incorporating measures of environmental effects is woefully inadequate, and several of the subsequent recommendations suggest specific techniques now available for better incorporation of environmental quality into project evaluation.

1. The water development planning process must utilize integrative and innovative techniques. These techniques include resource inventory and map overlay planning techniques, impact studies for evaluation, and systems analysis (where data is available) for gross resource planning. Political techniques include land-use zoning. (Henwood and Coop; McHarg and Clarke; Yanggen.)

2. To provide a data base for planning, environmental impact analysis, and land-use regulations, the Federal Government should encourage the states to make natural resource inventories.

All analytical methods for balancing water development and environmental quality require geological, biological, climatological, cultural, and demographic data. Such inventories would provide much of the required information for any assessment, and although considerable initial expense is required, subsequent savings in the costs of planning and impact assessment should more than justify the outlay. (Henwood and Coop; McHarg and Clarke; Yanggen.)

3. Every attempt should be made to incorporate dollar equivalents of environmental costs and benefits into economic evaluations of proposed water

developments, although no pretense should be made that such evaluations are descriptive of all such effects.

Benefit-cost analysis is a powerful evaluation tool if properly used, but its conceptual limitations prevent its serving as the sole method of impact evaluation. (Allee and Chapman; Henwood and Coop; McCloskey; McHarg and Clarke.)

4. New guidelines requiring environmental impact evaluation procedures of sufficient detail to portray accurately all the important positive and negative effects of proposed development alternatives should be developed to replace the present inadequate guidelines. The National Environmental Policy Act now requires impact statements, and the Water Resources Council Task Force Report has proposed full evaluation of environmental quality as part of the planning process. However, present impact reports suffer from inadequate funding, too few staff members with training in the biological and social sciences, and a prejudice in favor of development. The reports prepared thus far are well below the excellence possible with existing measurement and evaluation techniques. (Henwood and Coop; Ross.)

5. In all programs calling for Federal approval of plans, the government should require the States and cities to undertake comprehensive land-use planning and zoning based upon environmental as well as social and economic criteria. Such an approach has proved of great value in regulating the everyday uses of water, waterfronts, flood plains, and watersheds of insufficient magnitude to require full-scale impact analysis and planning, and thus preventing environmental deterioration through uncontrolled housing and commercial and industrial construction. The previously recommended natural resources inventory would furnish much of the data for such regulation. Waterfronts in urban areas, usually highly developed or at least susceptible to intense development, are often most in need of environmental quality enhancement. A special Federal effort is needed to encourage wise use of these resources. Public access to waterfront areas needs to be increased, and impact statements should incorporate evaluations of public access changes to result from development. Much of the activity on waterfronts is influenced by Federal agencies and policies, including military installations and many aspects of navigation. Also, Federal grant programs to cities can be enlarged and coordinated to encourage greater attention to considerations of environmental quality. (Luken and Langlois; McCloskey; Scott; Yanggen.)

6. The Federal Government can assist States which are attempting to set up regional goals and controls but are frustrated by local interest groups. Examples can be seen in the experience of the Tahoe Regional Planning Agency, Bay Area Development Commission, International Joint Commission

for the Great Lakes, and the Morrison Creek Plan. It can deny Federal funds for highway construction, sewage disposal, and other projects to counties within these regional organizations which are not complying with State or national goals. Legislation is presently being introduced to attach a rider to the Water Quality Control Act which would strengthen the States' position on subdivision sewage disposal because most environmental problems are regional in character and any effective action should be on a regional scale. (Beeton; Edmondson; Hedgpeth [Estuaries]; Scott; Yanggen.)

7. Demographic projections as a basis for predictions of water requirements should be used with extreme caution because they are very likely to become self-fulfilling prophecies. Thus, the use of present demographic projections may be considered bad planning. When it is successful it is likely to foster excessive population concentrations. A better approach to the problem would be to apply demographic planning to disperse the population into areas of good water supply. (Hollis and McEvoy; McCloskey.)

8. Further research on measurement, planning, and evaluation techniques should be encouraged. Although understanding of such fundamental processes as eutrophication in aquatic ecosystems is far from complete, there is much information that can be applied now in assessing the quality of the aquatic environment. Further improvements in measurement techniques is certainly warranted; these should include development of more useful systems analysis, measures of aesthetic and recreational values, and demographic projections. Good measurement techniques are essential to good planning and evaluation of water development. (Richerson and McEvoy; Swan.)

9. Regulatory agencies must be supplied with an adequate, expert staff, or the means to lure outside experts to discharge their statutory functions of protecting the public interest, including environmental quality. Without such assistance, it is simply not possible for regulatory commissions and agencies to properly discharge their responsibilities in reviewing project plans or supervising operations. (Fox; Henwood and Coop; Ross.)

10. All planning efforts should be aimed at developing valid alternative plans—including nondevelopment—which incorporate innovative methods as well as the traditional ones to achieve project ends. Because of narrow legal mandates, established interest group relationships, and bureaucratic tradition in Federal planning and construction agencies, valid alternatives are rarely developed during the planning process. This problem is as much political and psychological as structural and is the key to other recommendations. (Allee and Chapman; Luken and Langlois; McCloskey; McHarg and Clarke; Richerson and McEvoy.)

11. Independent consultants, technical committees, and lay advisory boards must be included in all water development planning. This mechanism is useful for incorporating the knowledge and independent judgment of imaginative and sometimes controversial persons into the planning process. (Fox; Ross.)

12. Effective monitoring programs need to be developed for areas such as coastal estuaries and river systems near population and industrial centers where monitoring procedures sufficient to evaluate present impacts and provide the historical data base for predicting effects of future development do not yet exist. Enforcement of present standards and planning of future projects are handicapped by the lack of such programs, and existing ones are very likely to have a major portion devoted to data gathering and lack the rapid evaluation systems so essential for an immediate and effective response to environmental change. (Beeton; Richerson and McEvoy; Teclaff and Teclaff.)

13. Public Law 566 should be amended to require protection of streams or sections of streams. Extensive reexamination of projects approved and being planned under Public Law 566 is called for and should be done in the light of present knowledge and new attitudes and values. Evaluation of projects which have been completed under this law should incorporate an ecological point of view and should be undertaken before further destruction results. Wetlands can no longer be looked upon as wastelands. (Jahn.)

III. *A separate governmental agency should be created to be responsible for the planning of water development in order to eliminate the prodevelopment prejudice of construction and regulatory agencies. This agency should have broad representation.*

It is difficult to expect an agency to display sufficient objectivity to evaluate nonengineering alternatives to today's development needs if that agency exists because of appropriations for the construction of engineering works and has accumulated skills and traditions in engineering. With a few exceptions, these agencies are not likely to respond quickly to the changing attitudes and values of the American people evoked by the deteriorating environment. A new agency is needed, one free of inherited prejudices and therefore able to develop the best possible plans for the change in attitudes toward the natural and social environment. References: Fox: McCloskey (this volume).

IV. To benefit from past experience and to improve present and future Planning, a large-scale, multiproject Program should be undertaken to determine the effectiveness of the planning of completed

projects with regard to economic returns as well as their environmental impact.

Detailed and accurate information regarding the economic, social, and ecological history of a broad sample of completed projects should be collected. These data should be organized in the light of present goals, with an assessment being made of the successes and failures of past planning to try to minimize environmental damage in future water development. These studies should be conducted by the Environmental Protection Agency which in turn should employ independent consultants as investigators and reviewers. As in all phases of planning and evaluation, public review and participation in these studies must be encouraged in every possible way.

The history of water use, population growth, and the present ecology of the Los Angeles Basin is an example of the kind of study we have in mind. Some planning entered into these developments, and it is not too late to try to find out what went so drastically wrong. (Hollis and McEvoy; White.)

Appendix D

President Roosevelt's Position

Dr. Kerwin quotes President Roosevelt message to Congress of April 13, 1908, because "This message is a landmark in the history of water-power legislation. It may be looked upon as the Confession of Faith of the Conservationists" (Kerwin, 1926, page 116). It is again worth repeating because of the policy background that was presented:

> In all permits of this character the duty of declaring a forfeiture, after notice and hearing, for failure to begin or complete construction within the time limited by the permit. or for other breach of conditions, should be definitely imposed by the proper administrative officer (in this case the Secretary of War). There have been many unfortunate experiences resulting from conditional grants which, though on their face apparently terminable for breach of condition, proved practically indeterminate because no one official was specifically given power to discover and declare the breach. The general statute regulating dams in navigable waters (act of 1906) though representing an advance, yet leaves uncertain much that should be definitely expressed in each act permitting the construction of dams under this statute. *A definite time limit is one of these important omissions* ... It is essential that any permit to obstruct them (rivers) for reasons and on conditions that seem good at the moment should be subject to revision when changed conditions demand. The right reserved by Congress to alter, amend, or repeal is based on this principle ... *Each right should be issued to expire on a specified day without further legislative, administrative or judicial action.*
>
> *Every permit to construct a dam on a navigable stream should specifically recognize the right of the Government to fix a term for its duration and to impose such charge or charges as may be deemed necessary to protect the present and future interests of the United States* in accordance with the act of June 21, 1906. *There is sharp conflict of judgment as to whether this general act empowers the War Department to fix a charge and set a time limit. All grounds for such doubts should be removed henceforth by the insertion in every act granting such a permit of words adequate to show that a time limit and a charge to be paid to the Government are among the interests of the United States which should be protected through conditions and stipulations* to be approved either by the War Department, or, as I think would be preferable, by the Interior Department.
>
> The provision for a charge is of vital importance. The navigability of every inland waterway ... should be improved for the purposes of interstate and foreign commerce upon a consistent unified plan by which each part should be made to keep every other. One means available for the improvement of navigation at a particular point on any river may be a dam creating a water pool of sufficient depth. Such a dam may ... develop power of sufficient value to pay in whole or in part for the

improvement of navigation at that point, and if there is any surplus it can be spent upon improvements at other points in accordance with the general plan. *Since the Government can do by any proper agency what it can do directly, it is in principle immaterial whether this income to construct, needed improvements is derived from works constructed directly by the Government or by a corporation acting under Federal authority, since Federal authority is the one indispensable legal Prerequisite for the work*, though the charge to be paid to the Government for the power would of course differ in two cases; indeed the charge would necessarily vary greatly, for where the improvement was both costly and of great benefit to the public, the charge would naturally be made low, the time limit long.

The income derivable from this source would materially aid in the complete improvement of our navigable waters ... This natural wealth (water powers) is the heritage of the people. I see no reason for giving it away, though there is every reason for not imposing conditions so burdensome as to prevent the utilization of the power.

...

We are now at the beginning of a great development in water power. Its use in electrical transmission is entering more and more largely into every element of the daily life of the people. *Already the evils of monopoly are becoming manifest*; already the spirit of the past shows the necessity of caution in making unrestricted grants of this power.

The present policy pursued in making these grants is unwise in giving away the property of the People in the flowing waters to individuals or organizations practically unknown, and granting in perpetuity these valuable privileges in advance of the formulation of definite plans as to their use. *In some cases the grantees apparently have little or no financial or other ability to utilize the gift, and have sought it merely because it could be had for the asking.*

In place of the present haphazard policy of permanently alienating valuable public property we should substitute a definite policy along the following lines:

First. *There should be a limited* or carefully guarded *grant* in the nature of an option or opportunity afforded within *a reasonable time for development of the plant* and for execution of the project.

Second. Such a grant of concession should be accompanied in the act making the grant by a provision expressly making it the duty of the designated official to *annul the grant if the work is not begun or plans are not carried out in accordance with the authority granted.*

Third. *It should also be the duty of some designated official to see to it that in approving the plans the maximum development of the navigation and power is assured*, or at least that in making the plans these may not be so developed as ultimately to interfere with the better utilization of the water or complete development of the power.

Fourth. *There should be a license fee or charge* which, though small or nominal at the outset, can in the future be adjusted so as to secure a control in the interest of the public.

Fifth. Provision should be made for the termination of the grant or privilege at a definite time, leaving to future generations the power or authority to review or extend the concession in accordance with the conditions which may prevail at the time" (Kerwin, 1926, pages 117-119).

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Literature Cited

Frederick, Kenneth D. and Roger A. Sedjo (ed.). 1991. America's Renewable Resources, Historical Trends and Current Challenges, Resources for the Future, Washington, DC. p. 34.

Goldman, Charles R. (ed.). 1973. Environmental Quality & Water Development, W.H. Freeman and Company, San Francisco, California. pp 44-56.

Graves, William. 1993. Water: The Power, Promise, and Turmoil of North America's Fresh Water. National Geographic Special Edition, National Geographic Society, Washington, DC.

Kerwin, Jerome G. 1926. Federal Water-Power Legislation, Columbia University Press, New York. p. 74.

Reisner, Marc. 1986. Cadillac Desert: The American West and Its Disappearing Water, Viking Press, New York.

Reuss, Martin. 1993. Water Resources Administration in the United States - Policy, Practice, and Emerging Issues, American Water Resources Association, Michigan State University Press, East Lansing, Michigan. p. 69-71, 122.

Smith, George Otis, and Others. 1913. The Classification of the Public Lands. Department of the Interior, U.S. Geological Survey Bulletin 537, U.S. Government Printing Office. p. 160.

Utley, Robert M. and Barry Mackintosh. 1989. The Department of Everything Else: Highlights of Interior History, Department of the Interior.

Endnotes

a. An interesting perspective of the competition between the Bureau of Reclamation (BOR) and the Corps of Engineers (COE) has been explored by Mark Reisner, who wrote "Cadillac Desert: The American West and Its Disappearing Water." The book discusses many of the debates, conflicts, and reasons that dams were built by Congress itself. Many of these same debates and conflicts are redebated during the relicense game. The book does not address the licensing of the private dams and is not comprehensive about the more positive decisions made by associations, corporations, and governments and the positive contribution that the other 90 percent of the dams have made.

b. The U.S. Water Resources Council, published two of these National Water Assessments. Compare The Nation's Water Resources 1975-2999, Volumes 1 and 3, Government Printing office, Washington, DC, 1978, to the National Geographic Special Edition of 1993, and note the creeping crises.

c. Dr. William B. Lord, Professor of Agricultural Economics and of Hydrology and Water Resources, University of Arizona, Tucson, Arizona. Comments at the "Balancing of Hydropower and Non-Power Resource Values" Conference in Denver, Colorado, July 22, 1991.

d. Dr. William B. Lord, Professor of Agricultural Economics and of Hydrology and Water Resources, University of Arizona, Tucson, Arizona. Comments at the "Balancing of hydropower and Non-Power Resource Values" Conference in Denver, Colorado, July 22, 1991.

e. "Dams: Water and Power in the New West," Eighteenth Annual Summer Conference, Natural Resources Law Center, University of Colorado School of Law, Boulder, Colorado, June 3, 1997.

f. May 16, 1972, quote from Bureau of National Affairs, Inc., "Environment Reporter," Monograph Number 17, Volume 4, Number 36, January 4, 1974, p. 8.

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